

On November 26, 2019, a pilot study conducted by S. McDermott, M.K. Hailer, and J.R. Lead<sup>1</sup> claimed to have discovered high levels of heavy metals in meconium samples for infants born in Butte, MT and was published on the front page of the Montana Standard newspaper<sup>2</sup>. The sample size consisted of 15 newborns in Butte and was compared to 17 newborns in Columbia, SC. The meconium data showed "*the magnitude of the differences in concentrations in Butte compared to Columbia is 1,792-fold higher for copper, 1,650-fold higher for manganese, and 1,883-fold higher for zinc.*" The researchers claimed this was cause for immediate concern. In the Montana Standard article, the authors stated, "*we believe that there is an urgent need for further research to understand the mechanisms and the human consequences of this potential public health emergency.*"

Following the release of the newspaper article, Dr. Hailer attended a Public Health Department meeting held on December 4<sup>th</sup> and presented the meconium findings. Dr. Charles Partridge (EPA, Region 8 Toxicologist) and Dana Barnicoat (EPA, community involvement coordinator for Montana), also attended the Public Health meeting.

On December 5<sup>th</sup>, Nikia Greene (EPA, RPM) contacted the study authors and requested physical samples and analytical output to aid with the review of the study results. Dr. Hailer (MT Tech) provided analytical output for the meconium samples collected in Butte on December 10<sup>th</sup>. Dr. Lead (University of South Carolina) has yet to provide any information for the samples collected from Columbia. The researchers also responded that archived meconium samples have limited utility (e.g., due to inadequate sample mass, holding times, metal degradation) and have not provided any samples for re-analysis.

Andrew Mutter, Rich Mylott, and Dana Barnicoat worked with the team to develop messaging for media inquiries. On December 12<sup>th</sup>, there were Montana Standard articles in response to the meconium study from the EPA (Dr. Partridge) as well as an opinion article by Betsey Smidinger. On December 13<sup>th</sup>, ATSDR released a statement indicating it "*does not concur with the author's closing statement of a "potential public health emergency," a statement that is not taken lightly by ATSDR*" and that the agency "*does not anticipate that a public health emergency is imminent based on the results of the McDermott et al. study.*" On December 14<sup>th</sup>, Dr. Ray Article wrote a response defending his colleague, Dr. Hailer.

Since this time, EPA has been compiling meconium data from the scientific literature to evaluate whether the claims of the McDermott et al. study are supported. Meconium concentrations from more than a dozen studies spanning five decades show meconium levels of copper, manganese, and zinc for Butte, MT infants are not elevated but are fully consistent with typical populations. The perceived 1,000-fold difference in concentration is a consequence the Columbia, SC dataset being uncharacteristically low. Several other independent evaluations (e.g., Montana Resources) have come to similar conclusions. EPA theorizes this is likely due to a units reporting error in the Columbia dataset, but the analytical output for these results would be needed confirm this. The compilation of the scientific literature was provided to all three researchers on December 21<sup>st</sup>. Dr. Lead indicated she plans to complete her review of this information by the end of January.

EPA will present the critical review of the McDermott et al. study at the Public Health Department meeting on February 5<sup>th</sup>. This will include a summary of the comparative literature evaluation and the review of analytical output for the Butte dataset. (If analytical output for the Columbia dataset is provided by Dr. Lead prior to this meeting, the Columbia dataset would also be included.)

Following this meeting, we recommend contacting the editor of the publishing journal for the McDermott et al. study (*Science of The Total Environment*) to present the results of EPA's critical review.

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<sup>1</sup> [ HYPERLINK "<https://www.sciencedirect.com/science/article/pii/S0048969719355226>" ]

<sup>2</sup> [ HYPERLINK "[https://mtstandard.com/news/local/health-study-shows-startling-levels-of-metals-in-butte-babies/article\\_d7c10bb3-68b6-588f-9028-a828ab17d034.html](https://mtstandard.com/news/local/health-study-shows-startling-levels-of-metals-in-butte-babies/article_d7c10bb3-68b6-588f-9028-a828ab17d034.html)" ]